

Original Article

Survey of Fatigue-Related Health Conditions of General Population in a Metropolis

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Objectives: To examine the overview of fatigue-related health conditions in the Korean general population.

Methods: Data were collected from 2,203 adults (1,126 men and 1,077 women) via a self-reporting questionnaire and their sleeping, exercise, stress, physical problems, use of functional food, and fatigue status were analyzed.

Results: The average sleeping hours was about 6.6 ± 2.0 hrs per day, and 24.3% of subjects didn't exercise (over 30 min) in a week. Around 16.5% of subjects were under severe stress, and 46.1% (36.9% male vs. 55.6% female) had had trouble with at least one form of physical distress including dyspepsia, headache or muscular pain. 45.4% (37.2% male vs. 53.9% female) of subjects used functional supplements. 46.3% (42.8% male vs. 50.0% female) of subjects complained of chronic fatigue, and they were significantly different compared with no-fatigue subjects regarding severe stress status (8.6% vs. 24.0%), frequency of physical distress (33.2% vs. 69.9%), and use of functional supplements (41.6% vs. 49.8%).

Conclusion: This result first reports the features of fatigue-related health conditions including prevalence of chronic fatigue in the Korean population. This data could be helpful to develop fatigue-focused traditional Korean medicine in the future.

Key Words : Chronic fatigue, quality of life, herbal medicine, traditional Korean medicine

Introduction

According to the progress of life sciences and lengthening of lifespan, fatigue-associated symptoms have been becoming a central medical issue. Acute fatigue can be easily relieved by resting; however, chronic fatigue is frequently problematic due to its duration and destruction of quality of life¹⁾. In particular, medically unexplained chronic fatigue is an agonizing illness that seriously impairs daily life. Nevertheless, the etiology of the disease is poorly understood and no effective conventional medical therapies exist²⁾.

On the other hand, Oriental medicine explains fatigue as an unbalanced inter-functional state of internal major organs as well as deficiency of vital elements such as *chi* and *blood*³⁾. The comprehensive approach of diagnosis and treatment for fatigue-associated symptoms is a strength of traditional Korean medicine (TKM), so people suffering from fatigue often visit Oriental doctors^{4,5)}.

Uncontrolled fatigue for long period leads to pathogenic status of physical, social, and occupational well-being⁶⁾. The anti-fatigue effects of TKM, including herbal medicines or acupuncture treatment, have been partially evidenced^{7,8)}. However, there is still a lack

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of TKM-based studies regarding epidemiology and pathophysiology of fatigue. TKM requires the development of standardized diagnosis, classification, and objective assessment of fatigue severity⁹⁾.

In the present study, an overview of fatigue prevalence and health-related factors were surveyed among the general population in a metropolis. This study provides reference data supporting a TKM-derived strategy for fatigue-associated disorders in the future.

Methods and Subject

1. Study design and data collection

This study was a survey which aimed to investigate the general status of health conditions focused on fatigue symptoms in the general population. Data were collected via self-reporting questionnaire from 2,203 adults (1,126 men and 1,077 women) in the city of Daejeon. Subjects were randomly selected on the street, at public places or at their workplaces, and were asked to provide their answers to questionnaire during June to October of 2010. This study didn't have criteria for inclusion or exclusion.

2. Contents of questionnaire and statistical analysis

The questionnaire was composed of seven questions chosen by an internal study-team. The seven questions were as follows:

1. What type is your personality? (chosed from: Introversive, Extroversive, Mixed)
2. How many hours do you sleep a day? and Describe your sleeping quality. (Deep sleep, Restless night, Insomnia)
3. How many days in a week do you exercise over 30 min? (0 days, 1 ~ 3 days, 4 ~ 7 days).
4. Please indicate your psychological stress status. (None, Moderate, Severe)
5. Do you have any physical distress? (If yes, please describe all)
6. Do you use any functional supplements? (If

yes, please describe all)

7. Have you felt fatigue symptoms for over six months?

In order to reduce the non-respondent rate, the questionnaire didn't ask about weight or obesity status, smoking or drinking alcohol. All answers were recorded according to each subject. Data were analyzed by appropriate statistical methods such as t-test or χ^2 -test (chi-square test) using PASW Statistics 17 program.

Results

1. Characteristics of subjects

The total number of respondents was 2,203, composed of 51.1% and 48.9% men and women, respectively. The average age of both men and women was 39 (ranging from 18 to 64). The occupation was significantly different between the two genders, especially higher for physical work among men but for homemakers in women (Table 1).

2. Analysis of health-related factors according to sex

The portion of introversive and extroversive personality of subjects was 16.8% and 19.8% respectively, and it showed a very similar pattern among men and women. The average daily sleeping time was 6.6 ± 2.0 hrs, and 49.3% of subjects had poor quality of sleep. No significant difference was observed between the two genders. 25%~27% of subjects did exercise more than four days a week, with male subjects having a tendency to do more exercise than female. 16.5% of subjects were under severe stress.

The frequency of physical distress was significantly different at 36.9% for men and 55.6% for women ($p < 0.01$). The distribution was similar: dyspepsia (men 27.4% vs. women 31.2%), muscular and joint pain (men 24.5% vs. women 28.5%) and headache (men

Table 1. Characteristics of subjects

Items	Sub-classes	Men	Women	Total
Number of subjects (%)		1,126 (51.1)	1,077 (48.9)	2,203 (100)
Median age in years (range)		39 (18-64)	39 (18-64)	39 (18-64)
Fields of work	Mental	362 (32.1)	233 (21.6)	595 (27.0)
	Physical	494 (43.9)	218 (20.2)	712 (32.3)
	Mixed work	74 (6.6)	74 (6.9)	148 (6.7)
	Student	111 (9.9)	157 (14.6)	268 (12.2)
	Homemaker	3 (0.3)	331 (30.7)	334 (15.2)
	Jobless	85 (7.5)	67 (6.2)	152 (6.0)

17.1% vs. women 27.5%) between male and female subjects. Other distress (about 20% in both men and women) included rhinitis, menstrual pain, or hand numbness and so on. 45.4% (men 37.2% vs. women 53.9%) of subjects used functional supplements, and

the most common items were vitamins, ginseng products, and herbal medicines in that order. The prevalence of fatigue lasting six months or more was significantly higher in women (50.0%) compared with men (42.8%, $p < 0.5$ Table 2).

Table 2. Health-related factors according to sex

Items	Sub-classes	Male (%) (n = 1,126)	Female (%) (n = 1,077)	Total (%) (n = 2,203)
Type of personality	Introversive	17.1	16.5	16.8
	Extroversive	18.9	20.7	19.8
	Mixed	64.0	62.8	63.4
Sleeping hours and its quality	Average hours of sleep	6.5 ± 2.2 hrs	6.7 ± 1.7 hrs	6.6 ± 2.0 hrs
	Deep sleep	53.1	48.2	50.7
	Restless night	44.2	47.8	46.0
	Insomnia	2.7	4.0	3.3
Exercise (over 30 min) per week	0 days	17.7	31.2	24.3
	1 ~ 3 days	54.6	43.1	49.0
	4 ~ 7 days	27.7	25.7	26.7
Stress status	None	2.6	9.0	5.9
	Moderate	80.1	75.2	77.6
	Severe	17.3	15.8	16.5
Physical distress (multiple choice)	Complaining subjects**	36.9	55.6	46.1
	Diabetes mellitus	8.2	3.0	5.1
	Hypertension	14.2	8.0	10.5
	Headache	17.1	27.5	23.3
	Dyspepsia	27.4	31.2	29.7
	Lumbago	8.9	11.4	10.3
	Muscle, joint pain	24.5	28.5	26.9
	Depression	3.6	8.2	6.3
	Others	20.3	21.9	21.6
Use of functional supplements (multiple choice)	Using subjects*	37.2	53.9	45.4
	Herbal medicines	10.3	9.3	9.7
	(Red) ginseng	33.9	26.3	29.5
	Vitamin, minerals	35.3	42.3	39.4
	Others	33.3	44.6	39.9
Existence of fatigue* (over six months)	Fatigue positive	42.8 (482)	50.0 (538)	46.3 (1,020)
	Fatigue negative	57.2 (644)	50.0 (539)	53.7 (1,183)

Statistical significance between men and women using χ^2 -test as * $p < 0.05$ or ** $p < 0.01$.

3. Analysis of health-related factors according to presence of fatigue

The difference of introversive or extroversive personality didn't affect the prevalence of subjects with chronic fatigue. Even though the average sleeping hour and exercise frequency were very similar, the number of subjects having poor quality of sleep such as restless sleep or insomnia was significantly higher in fatigue-positive subjects than the fatigue-negative group ($p < 0.05$). The number of subjects having severe stress was 3-fold higher in fatigue-positive subjects (24.0%) than the fatigue-negative group (8.6%, $p < 0.05$).

The prevalence of physical distress was significantly higher by 2-fold, as 69.9% of the fatigue-positive group and only 33.2% of fatigue-negative subjects ($p < 0.01$). Among each group, the distribution of distress was broadly similar as dyspepsia (28.0% vs. 30.8% of fatigue negative and positive groups), muscular and joint pain (24.1% vs. 28.6% of fatigue negative and positive groups) and headache (19.8% vs. 26.6% of fatigue negative and positive groups). The usage rate of functional supplements was 41.6% and 49.8% in fatigue-negative and -positive groups respectively, and the choice of items was the same pattern in both groups (Table 3).

Table 3. Health-related factors according to presence of fatigue

Items	Sub-classes	Fatigue-negative (n = 1,183)	Fatigue-positive (n = 1,020)	Total (%) (n = 2,203)
Type of personality	Introversive	17.1	15.9	16.8
	Extroversive	18.8	22.2	19.8
	Mixed	64.1	61.9	63.4
Sleeping hours and quality*	Average hours of sleep	6.6 ± 2.0 hrs	6.5 ± 1.9 hrs	6.6 ± 2.0 hrs
	Deep sleep	61.1	56.1	50.7
	Restful night	37.1	39.0	46.0
	Insomnia	1.9	4.9	3.3
Exercise (over 30 min) per week	0 days	20.6	28.4	24.3
	1 ~ 3 days	50.2	47.7	49.0
	4 ~ 7 days	29.3	23.9	26.7
Stress status*	None	13.5	6.0	5.9
	Moderate	77.8	70.0	77.6
	Severe	8.6	24.0	16.5
Physical distress* (multiple choice)	Complaining subjects**	33.2	69.9	46.1
	Diabetes mellitus	3.8	6.0	5.1
	Hypertension	13.5	8.1	10.5
	Headache	19.8	26.6	23.3
	Dyspepsia	28.0	30.8	29.7
	Lumbago	11.2	10.0	10.3
	Muscle, joint pain	24.1	28.6	26.9
	Depression	5.6	6.6	6.3
Use of functional supplements (multiple choice)	Others	38.4	11.0	21.6
	Using subjects*	41.6	49.8	45.4
	Herbal medicines	8.5	10.8	9.7
	(Red) ginseng	31.9	27.4	29.5
	Vitamin, minerals	39.2	39.5	39.4
	Others	37.4	41.5	39.9

Statistical significance between fatigue-positive and negative subjects using χ^2 -test as * $p < 0.05$ or ** $p < 0.01$.

Discussion

This study was designed to obtain the brief features of health-related factors and prevalence of chronic fatigue in the general population. The main goal was to know the frequency of adults complaining of fatigue lasting six months or more, and then any association with personality, sleep, exercise, physical distress, or use of functional supplements was investigated. This study was conducted by randomly-selected people in heterogeneous places answering the questionnaire. The data from all respondents were included in the analysis.

The subjects were composed of similar sex and age proportions. No significant difference of character, sleep, exercise and stress was observed between men and women. However, the frequency of physical distress was higher in women than men. This might lead to higher rate of functional supplement use in women. The rate of using functional supplements was 45.5% among adults in this study, which was higher than 40.7 and 38% among high-school and middle-school students in other studies^{10,11}.

The subjects reporting chronic fatigue symptoms were 46.3% (42.8% men vs. 50.0% women). This predominant tendency of chronic fatigue among women was in accordance with previous reports in Korea and other countries^{12,13}. There have been several studies focusing on prevalence of chronic fatigue in Korea. However, those studies were not from the general population but from specific subjects, mainly clinic visitors for medical check-ups. According to the investigators, there were large gaps of fatigue prevalence from 10%–43%^{14,15}. These big differences might result from survey methods, ranging from simply asking the chronic fatigue symptoms to doctor's interviewing every subject. The prevalence of chronic fatigue in Hong Kong, the United Kingdom, and the United States were 10.7%, 15.0%, and 10.3% of the general population, respectively^{13,16,17}. It is supposed that the

prevalence of chronic fatigue would be lower in the present study if they had been interviewed by doctors.

Chronic fatigue is a manifestation of subjective feeling, so the prevalence and severity of chronic fatigue would vary according to ethnicity and psychosocial factors¹⁸. This study didn't clarify the severity or cause of fatigue. Fatigue can be classified into medically explained and unexplained fatigue, and one Korean study reported that 80.5% of chronic fatigue was medically explained and 57.1% of them had psychological causes¹⁹. It was well known that psychological disorders, including depression or anxiety, are strongly associated with incidence of chronic fatigue²⁰. The high frequency of severe stress, poor quality of sleep, and physical distress were linked to the causes of chronic fatigue in this study. Personality type and exercise times didn't affect the prevalence of chronic fatigue.

For their health improvement, 41.6% of men and 49.8% of women have used functional supplements. Vitamins were the most favorite, with red ginseng the second choice by fatigue-positive as well as fatigue-negative adults. Fatigue symptoms were very prevalent, and the poor understanding of etiology and no effective therapy in conventional medicine leads to the frequent choice of alternative and complementary therapies by patients with chronic fatigue worldwide²¹. However, recently the usage rate of herbal medicine by patients is decreasing in Korea. The present result showed only one-third choice of herbal medicine compared with ginseng products by subjects with chronic fatigue. Based on above fact, a new strategy for patients with chronic fatigue might be needed in the field of TKM. It may require standardized herbal medicines with strong scientific evidence for their efficacy and safety such as ginseng products have.

This study has two main limitations; the first is that it was only one regional city-based investigation, decreasing the liability for data from the general population, and the second is that it was a non-interview survey. However, this study has produced

reference data for chronic fatigue prevalence and health-related conditions among the general population, which will be helpful in therapeutic developments for chronic fatigue in the future.

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